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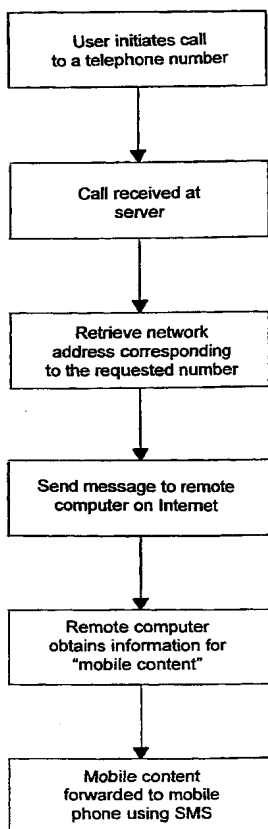
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[Continued on next page]

(54) Title: A METHOD OF SUPPLYING INFORMATION TO A USER OF A MOBILE STATION



(57) Abstract: A user of a mobile station (10) wishing to obtain information, dials a predetermined number to obtain the information. The call is routed to an interactive voice response (IVR) server (12) and associated database (14) by a telephone communications network (20). The IVR server (12) is in turn connected to a plurality of computers (16) on a second network (18). The database (14) stores the relationship between a plurality of telephone numbers and a plurality of IP addresses of the computers (16). The user dials a telephone number to request information, and the telephone call is routed to the IVR server (12). The IVR server (12) uses the related IP address to send a message to the remote computer (16). Included in the message is the number of the mobile station (10). The remote computer (16) obtains the relevant information from an associated memory device and sends a message including the information using the Short Message Service (SMS) Protocol to the mobile station (10).



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A METHOD OF SUPPLYING INFORMATION TO A USER OF A MOBILE STATION

BACKGROUND OF THE INVENTION

THIS invention relates to a method of supplying information to the user of a mobile station and to a system therefor.

SUMMARY OF THE INVENTION

According to the present invention there is provided a method of supplying information to a user of a mobile station, the method comprising the steps of:

defining a relationship between a plurality of telephone numbers and the network addresses of a plurality of computers on a first network;

storing data representing said relationships;

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receiving, at a server, a request from a user via a telecommunications network for one of the plurality of telephone numbers;

retrieving the network address corresponding to the requested number;

forwarding a message via the first network to the computer located at the retrieved network address corresponding to the requested number, said computer being responsive to the message to run a computer program; and

sending information from the computer to the user using the Short Message Services (SMS) Protocol.

The request received from the user is preferably a telephone call made by the user.

The message forwarded to the computer located at the retrieved network address may include the number of the user's mobile station to which the SMS is to be sent.

According to the present invention there is provided a communication system comprising a processor connected to a first network and to a telecommunications network, the processor being adapted to communicate with a user via the telecommunications network and being further adapted to communicate with a remote processor via the first network, the processor being further adapted to receive a telephone call from the user and to send a message to the remote processor, said remote processor being responsive to the message to send a Short Message Services (SMS) message containing information to the user.

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The communication system may further comprise a memory device which stores data representing a relationship between a plurality of telephone numbers and the network addresses of a plurality of remote processors.

Preferably, the processor is further adapted to receive a telephone call from the user and to access the memory device to determine which network address is associated with the telephone number the user dialled, the processor being further adapted to then send the message to the remote processor at that network address.

The processor may be further adapted to include in the message sent to one of the remote processor, the number of a mobile station used by the user to initiate the telephone call.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a simplified schematic diagram of an embodiment of the system of the present invention;

Figures 2 and 3 are flow diagrams illustrating the first part of the method of the present invention carried out using the system of Figure 1;

Figure 4 is a flow diagram illustrating the transaction flow between the IVR server and application server of Figure 2 in more detail; and

Figure 5 is a flow diagram showing a second part of the method of the present invention.

DESCRIPTION OF EMBODIMENTS

Referring to Figure 1, the system comprises a plurality of mobile stations 10 in the form of mobile telephones, each of which can connect to an Interactive voice response (IVR) server 12 and associated database 14 by a telephone communications network 20. The telephone communications network 20 is typically a Global System for Mobile Communications (GSM) network. A user uses one of the mobile stations to dial a number to request information which is then sent via Short Message Services (SMS) to the mobile station 10 of the user.

The IVR server 12 is connected to a plurality of computers 16 on a second network 18. The computers 16 are typically application servers. The computers 16 interact with content or web server (not shown), or associated database, to retrieve the requested information.

It will be appreciated that although Figure 1 illustrates the use of one IVR server 12, the present invention could be implemented using a plurality of IVR servers 12, each being connected to a plurality of computers 16.

Figures 2 and 3 illustrate a transaction flow of the system illustrated in Figure 1. A user of the system dials a predetermined number 22 on the telephone 10. The telephone call is routed 24 using the telecommunication network 20 to the IVR server 12 with its associated database 14. The IVR server 12 has an application running thereon, typically written in JAVA or C++, and waits for a call to be received.

The number called by the user contains various parts. A first part routes the call to the IVR server 12, while a second part relates to the address of a computer 16 on the network 18. For example, the number may be 083 190

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XXX where 083 190 routes the call to the IVR server 12. The three remaining digits relate to the addresses of computers on the network 18. This relationship is stored on the database 14, where each complete telephone number is associated with a computer address. This address is typically the Internet Protocol (IP) address of the computer. For example, the number 083 190 001 can be associated with a computer 16a, the IP address of which is 192.168.2.18, while telephone number 083 190 002 can be associated with computer 16b, the IP address of which is 194.176.2.13. The number may also be related to a specific port on the computer 16.

Using the related IP address and port number, a message is sent 26 via the communications network 18 to the remote computer 16. The communications network 18 may be, for example, a Local Area Network (LAN), a Wide Area Network (WAN) or the Internet.

Any number in any combination can be defined to be controlled by any computer or application server 16 located on any Local Area Network (LAN) or Wide Area Network (WAN). For example:

1) **Traditional Dialed numbers**

<u>Dialed Number,</u>	<u>IP Address,</u>	<u>Port Number</u>
083 123 2000,	196.10.10.1,	1998
083 123 2002,	96.25.20.5,	1900
083 123 2010,	192.15.5.27,	1985

2) **Speed Dial numbers**

<u>Dialed Number,</u>	<u>IP Address,</u>	<u>Port Number</u>
083 920 1,	196.10.10.1,	1998
083 123 5,	196.25.20.5,	1900
083 121,	192.15.5.27,	1985

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3) **Extended Dialed numbers**

<u>Dialed Number,</u>	<u>IP Address,</u>	<u>Port Number</u>
083 123 2000 123456,	196.10.10.1,	1998
083 123 2002 4562334536,	196.25.20.5,	1900
083 123 2010 568657,	192.15.5.27,	1985

The traditional numbers are the digit length typically used by a national telephone company number scheme while the speed dial and extended numbers are the number schemes typically used by the GSM networks.

The numbers can also be extended to alphanumeric dialling, for example, 083123Coke which represents 083 123 2653 or 083 123Pepsi which represents 083 123 73774.

In any event, each number is allocated to a specific type of information which the user can request. For example, and referring to the above tables, 083 121 will route the call to IP address 192.15.5.27 port number 1985 which will provide weather information to anyone dialling 083 121.

The IVR server 12 invokes the computer 16 on the requested network address and port to respond with the requested information. A communication session 28 is now set up between a listening application running on the application server 16 and the IVR server 12 whereby the application server 16 receives parameters and sends commands to the IVR Server 12.

What will be appreciated is that control of the communication link is effectively passed to the remote computer or application server 16.

Figure 4 illustrates in more detail the communication between the application server 16 and the IVR server 12.

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The IVR server 12 informs the application server 16 of an incoming call 26. A communication session 28 is set up between the application server 16 and the IVR server 12. The commands sent by the application server 16 will be either disconnect call, request DTMF input or play prompt, and will be determined by what application the system is being used for. The commands are sent using a text protocol. In this way, the call is controlled by the sequence of the commands sent by the application server 16 and relayed to the user via the IVR server 12.

After each command has been received by the IVR server 12, the IVR server 12 responds to the application sever 16 with an acknowledgement such as "0", "1" or "2" where "0" represented successful transaction, "1" represents failed transaction and "2" represents transaction failed due to call dropped.

Once the application server 16 decides to end the communication session 28, a message 32 is sent from the application server 16 to the IVR server 12. The IVR server 12 acknowledges 34 the disconnect message and disconnects the communication session.

Referring to the above example, different information is allocated to a different telephone number, so that the information returned to the user will depend on the number dialed. In this case, 083 190 101 may be a request for the price of a specific share price, for example, while 083 190 102 may be a request for the price of a different share. The IVR server 12 will not try and determine which share price is requested, but will use part of the number to logically route the call to a remote computer 16 (as described above).

The IVR server 12 sends the application server 16 the caller's mobile station number and request. When this is received by the application server 16, it instructs the IVR server 12 to disconnect the call.

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The application server 16 interacts with a content or web server, or an associated database, and retrieves the requested information. The application server 16 then forwards the requested information via SMS to the mobile station of the caller.

The SMS can be sent directly to the GSM SMSC via the application server using a third party software component, or can be directly sent to the SMSC via a file transfer protocol.

Thus it will be appreciated that the present invention provides a communication method and system which allows information to be passed to a mobile station, typically a mobile telephone. Because the IVR server 12 can be connected to a plurality of different computers or application servers 16, a third party wishing to provide information to users of mobile phones is able to merely load an application on their computer or application server 16 and then use a centrally located IVR server 12 as the communication link to the GSM network. Thus many third parties can be given access to the GSM network without having to install an IVR server at each of their individual sites. This is essentially because the application and data which reside on the remote computer or application server 26 have been separated from the communication application and data which reside on the IVR server 12.

CLAIMS:

1. A method of supplying information to a user of a mobile station, the method comprising the steps of:

defining a relationship between a plurality of telephone numbers and the network addresses of a plurality of computers on a first network;

storing data representing said relationships;

receiving, at a server, a request from a user via a telecommunications network for one of the plurality of telephone numbers;

retrieving the network address corresponding to the requested number;

forwarding a message via the first network to the computer located at the retrieved network address corresponding to the requested number, said computer being responsive to the message to run a computer program; and

sending information from the computer to the user using the Short Message Services (SMS) Protocol.

2. A method according to claim 1, wherein the request received from the user is a telephone call made by the user.
3. A method according to any preceding claim, wherein the message forwarded to the computer located at the retrieved network address

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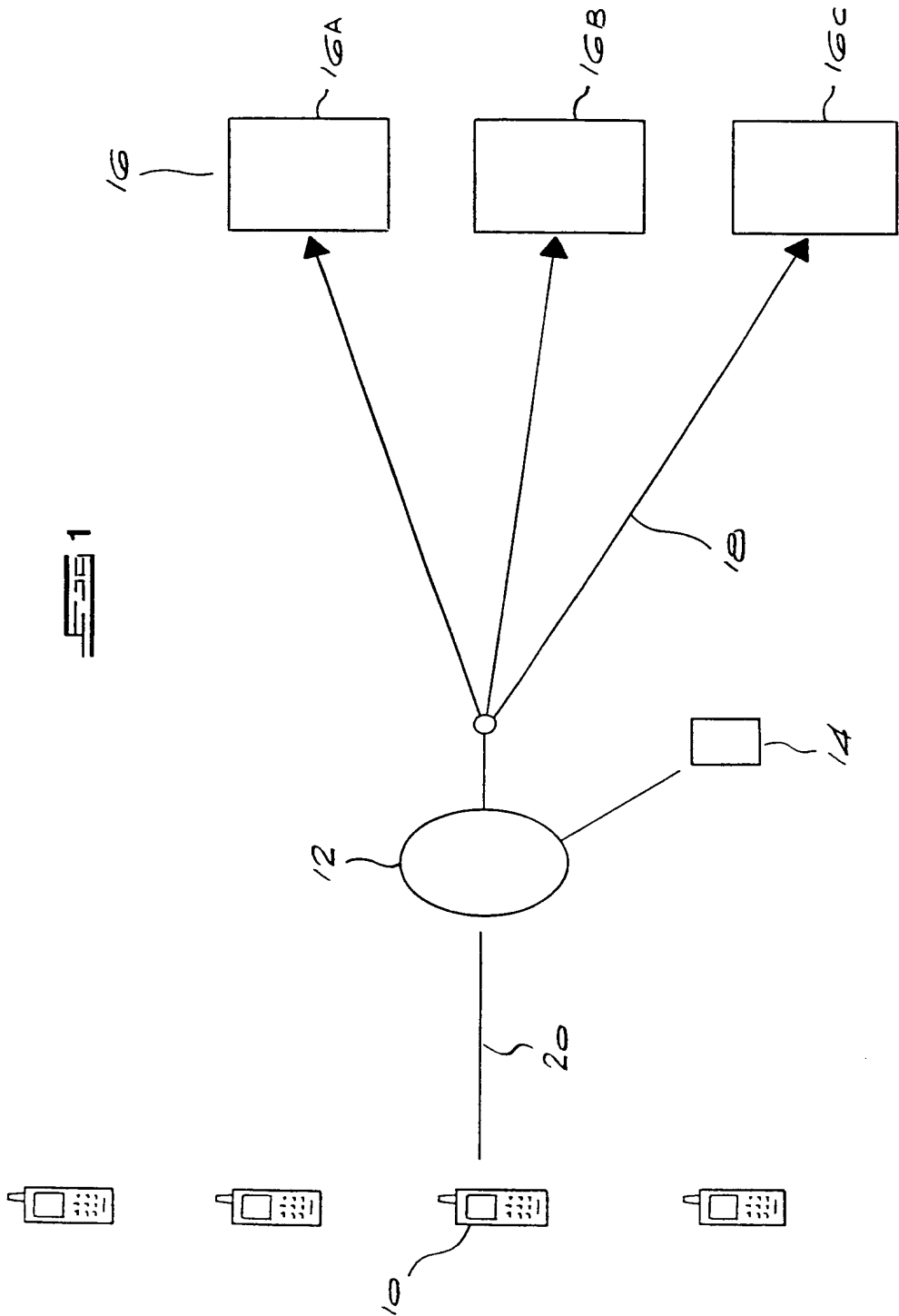
includes the number of the user's mobile station to which the SMS is to be sent.

4. A machine readable medium comprising instructions, which when executed by a machine, cause the machine to perform the method steps in any one of claims 1 to 3.
5. A communication system comprising a processor connected to a first network and to a telecommunications network, the processor being adapted to communicate with a user via the telecommunications network and being further adapted to communicate with a remote processor via the first network, the processor being further adapted to receive a telephone call from the user and to send a message to the remote processor, said remote processor being responsive to the message to send a Short Message Services (SMS) message containing information to the user.
6. A communication system according to claim 5 further comprising a memory device which stores data representing a relationship between a plurality of telephone numbers and the network addresses of a plurality of remote processors.
7. A communication system according to claim 6 wherein the processor is further adapted to receive a telephone call from the user and to access the memory device to determine which network address is associated with the telephone number the user dialled, the processor being further adapted to then send the message to the remote processor at the network address.
8. A communication system according to claim 7 wherein the processor is further adapted to include in the message sent to the remote processor, the number of a mobile station used by the user to initiate the telephone call.

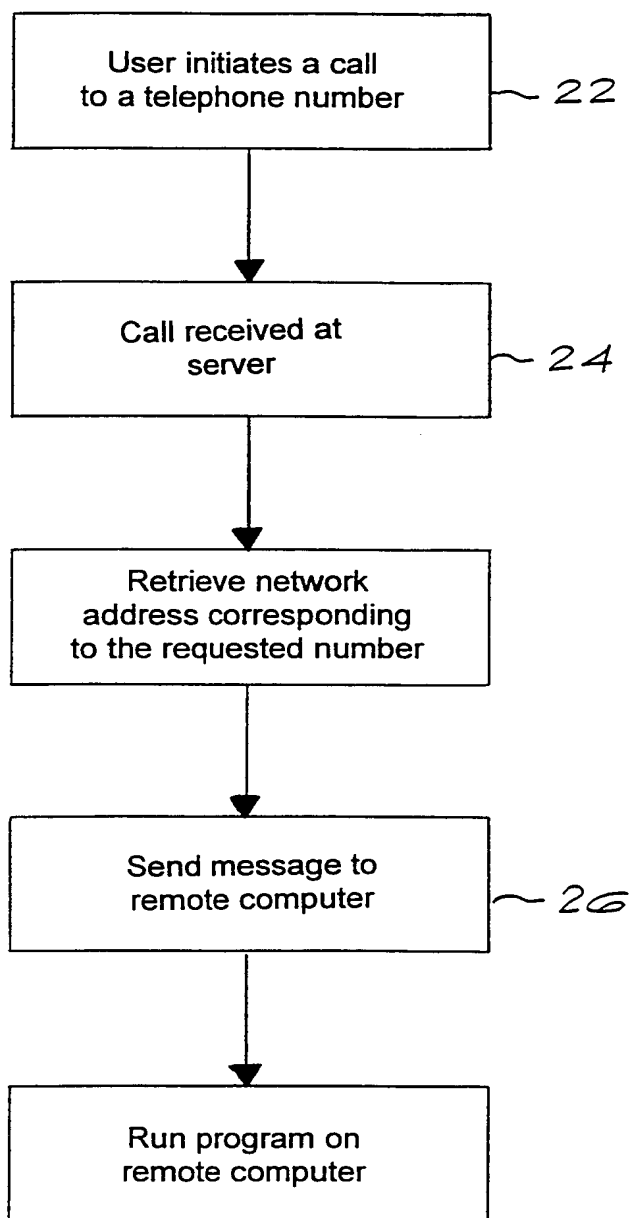
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9. A method substantially as herein described with reference to the accompanying drawings.
10. A system substantially as herein described with reference to the accompanying drawings.

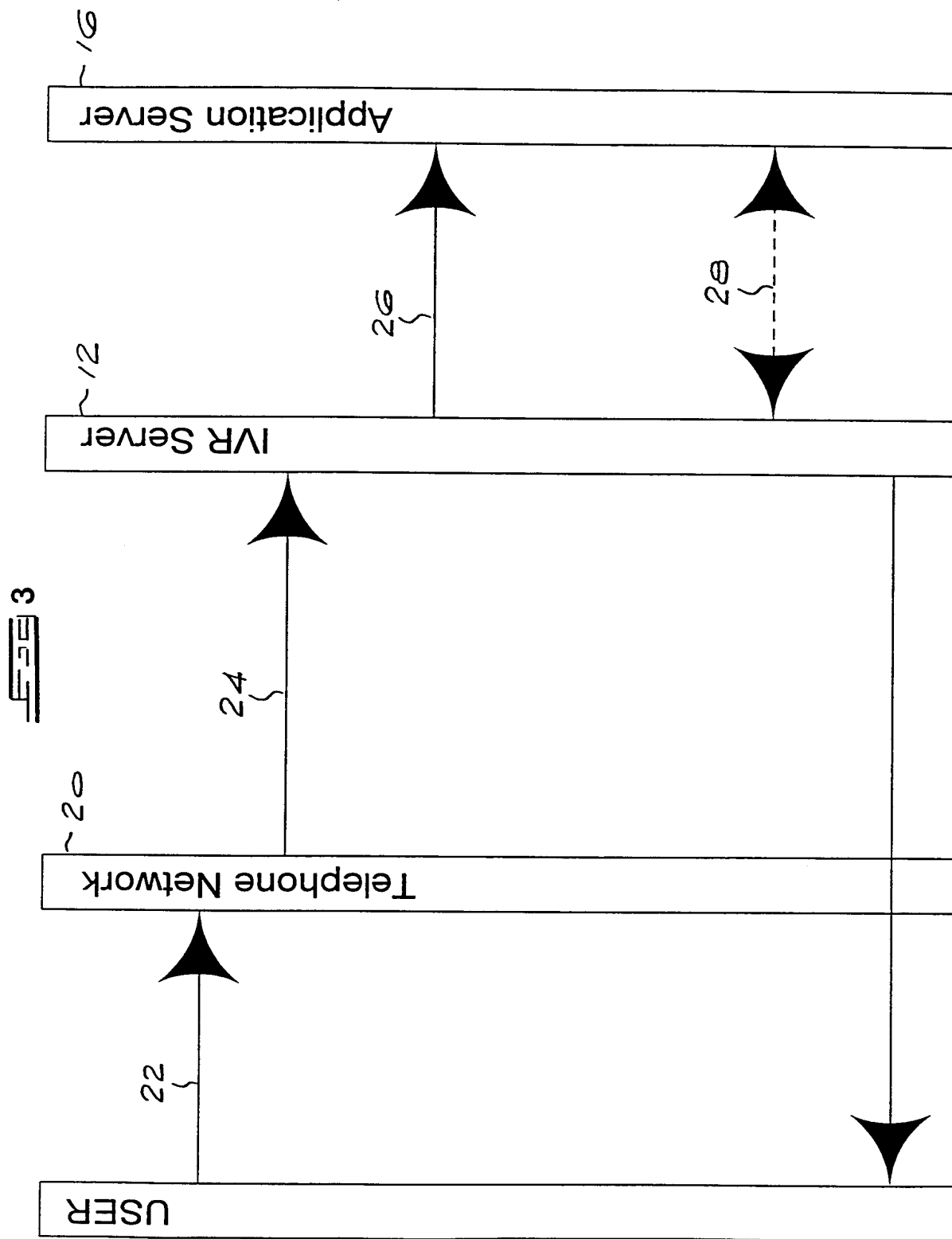
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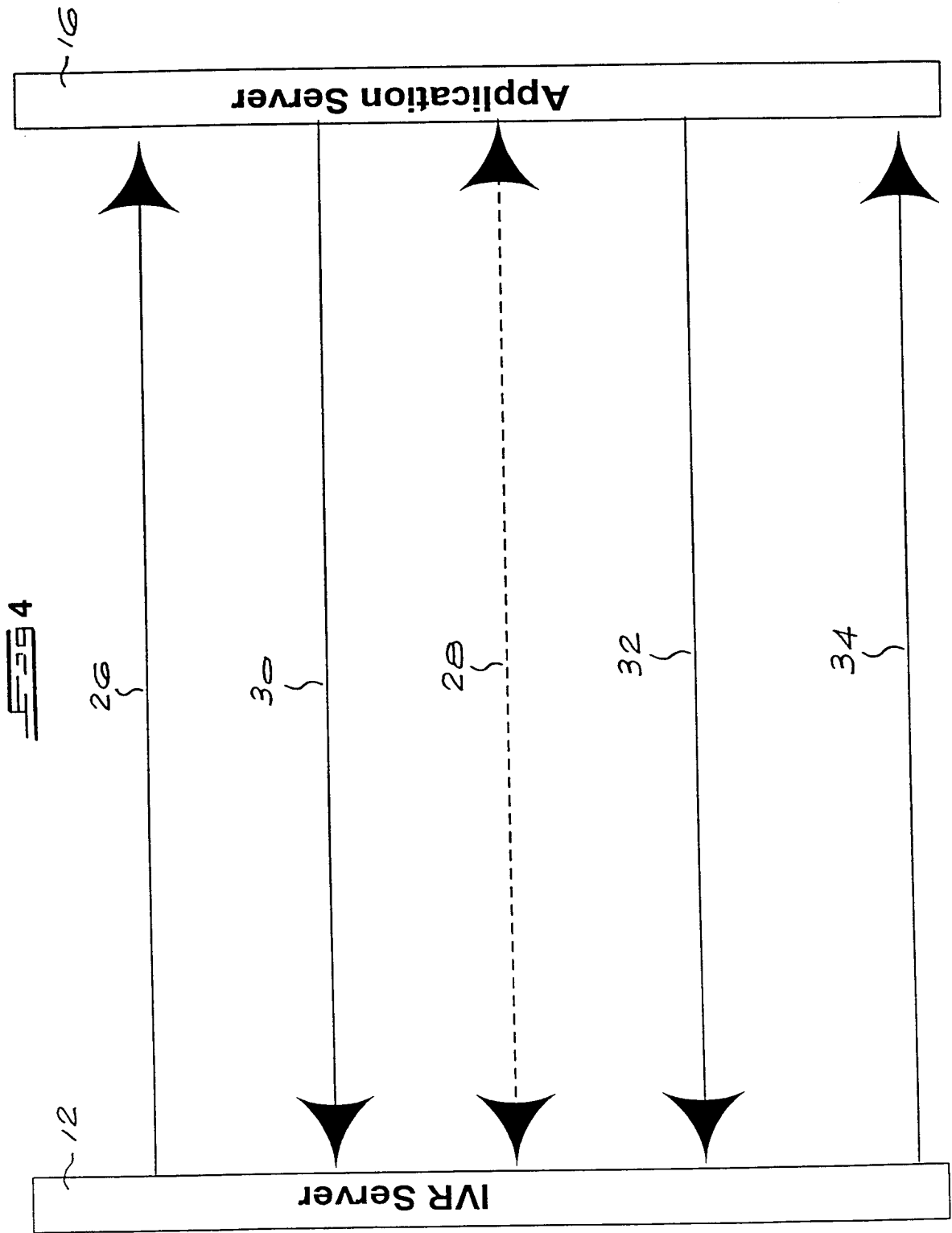


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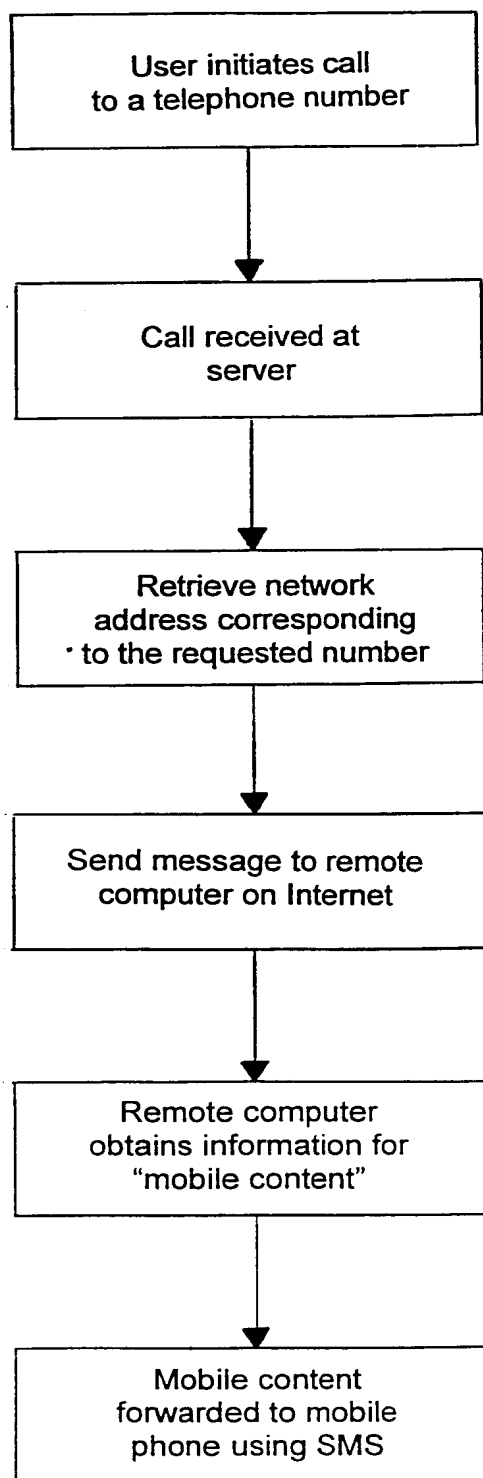
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Fig 5

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 00/01744

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L29/06 H04Q7/22 H04M3/493

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04Q H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 12365 A (WINROTH MATS OLOF ; TELIA AB PUBL (SE); HYLLANDER KLAS (SE)) 11 March 1999 (1999-03-11) page 3, line 16 -page 9, line 25 claims 1-36	1,2,5,6
A	WO 99 12364 A (NOKIA TELECOMMUNICATIONS OY ; LUMME MARTTI (FI); HIPPELAEINEN LASSI) 11 March 1999 (1999-03-11) page 2, line 9 -page 3, line 8 page 8, line 21 -page 12, line 7 -/--	1-10



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- * & * document member of the same patent family

Date of the actual completion of the international search

28 December 2000

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 00/01744

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>LOW C: "THE INTERNET TELEPHONY RED HERRING"</p> <p>HP LABORATORIES TECHNICAL REPORT, XX, XX, no. 96/98, 15 May 1996 (1996-05-15), pages 1-15, XP002043669</p> <p>page 7, paragraph 6.0 -page 12, paragraph 6.7</p> <p>-----</p>	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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